WHITE-TAILED DEER MANAGEMENT PLAN

I. OBJECTIVE

The objective of the White-Tailed Deer Management Plan (WTDMP) is to manage the increasing impact of white-tailed deer on public and private lands within the limits of the City of Rockville.

II. BACKGROUND

Rockville's original White-Tailed Deer Control Policy (WTDCP) of tolerance and coexistence was developed in 1995. The policy was developed because residents were concerned about the rising white-tailed deer population and its impact on landscaping and gardens. At that time, the issue was seen more as a nuisance than a problem with deer over-population.

The policy outlined a methodology for coping with an increasing deer population, starting with conducting aerial surveys, analyzing complaints and providing public information, including educational materials and consultations on methods of exclusion and deer repellents.

The policy also outlined a control plan based on the impacts of deer on public safety, including but not limited to auto accidents. The control plan called for population management and lethal reductions when other methods failed, and a significant impact initiated the need for conflict resolution.

In 2009, after many years of a tolerance and coexistence policy (WTDCP) and increased concerns related to deer, the Mayor and Council formed a White-Tailed Deer Task Force (WTDTF). The task force was charged with studying and analyzing current white-tailed deer population data and impacts, including the methods and local practices used to manage a desired deer population. The task force relied on the documents in the reference section of this document and presentations from local experts as the primary sources of data and information. The Maryland Department of Natural Resources Heritage and Wildlife Services (DNR), Maryland National Capital Park and Planning Commission (MNCPPC) - Montgomery and Howard counties, the Humane Society of the United States and the Suburban White-Tailed Deer Management Group made presentations to the task force.

The majority of the impacts associated with deer throughout Montgomery County are likely to be the same as those experienced within Rockville. The only available data specific to Rockville was Deer Vehicle Collisions (DVC), aerial surveys from the mid-1990s, and anecdotal stories and personal experience from staff. The task force was asked to use this information to update the City's WTDCP and to generate specific recommendations to the Mayor and Council.

III. OVERVIEW

The white-tailed deer (Odocoileus virginianus) is a large, graceful and attractive part of the vertebrate fauna of eastern North America. As a species, the whitetail is appreciated and valued for its beauty, food value and for being symbolic of that which is wild and natural in our increasingly urban surroundings. People place many values, both positive and negative, on deer. Whether we find deer desirable is an opinion based on many factors and experiences. People enjoy photographing, watching, hunting, studying and simply knowing that deer exist. Some people suffer economic losses because of deer, while others may derive significant income from their presence.

During the past several decades, the landscape of Rockville has undergone significant change. Extensive suburban development in this once semi-rural landscape has brought about dramatic ecological changes that have affected many species, especially the white-tailed deer.

While quite rare in the early 1900s, the white-tailed deer population has recently reached densities never before seen in many areas. This remarkable recovery is due to effective conservation efforts, the elimination of natural predators and an extremely adaptable animal that is able to take advantage of the habitat changes brought about by urban sprawl and the reduction in agricultural land use. There has also been a reduction in the land area open to hunting and societal changes have led to fewer hunters. The combination of these factors has resulted in a surge of deer populations around the region.

Development practices utilized over the past several decades have fragmented forests and farms, creating ideal habitat for deer. Deer prefer the edges of forests, where they can access both wooded cover and open fields for foraging. Suburban development has greatly multiplied this forest edge, creating what has been described as "a deer factory."

IV. CONCERNS

The primary concerns of an increasing white-tailed deer population are issues related to public safety and health. These safety concerns include deer vehicle collisions and Lyme disease. Ecological and biological impacts, as well as direct impacts to residential landscaping comprise the other major concerns highlighted in this document.

Deer Vehicle Accidents

Deer Vehicle Collisions occur throughout the City of Rockville. Two locations in the City limits comprise 40 percent of all DVCs. The two locations with the highest incidence of collisions include West Gude Drive (19 percent) and Norbeck Road/Route 28 (18 percent). Deer Vehicle Collisions increased from 1,343 countywide as reported by the Montgomery County Police Department in 1994 to 1,841 reported in 2008. State Farm Auto Insurance considers Maryland to be in a high-risk zone with the odds of striking a deer at 1 in 141 during the course of a year, compared with the national average of 1 in 208. In 1997 and 1998, the Rockville City Police Department recorded 51 and 58 deer incidents. More recent records indicate that in 2008, there were approximately 133 deer-related incidents in Rockville, 116 in 2009 and 121 in 2010. The vast majority of the incidents are related to dead deer in the right-of-way.

State Farm Insurance Company estimates DVCs in Maryland numbered close to 32,000 at a cost of $106.9 million to drivers.

State Farm also reports 21 percent more deer-related collisions nationally in 2009-10 than in a 2004-05 survey, even though vehicle miles driven are up only two percent.

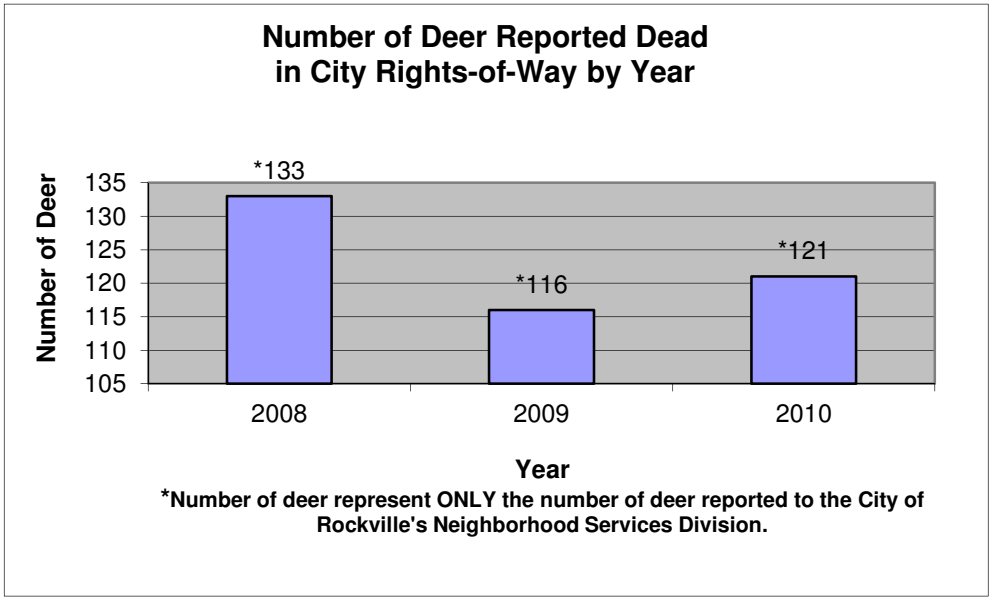

FIGURE 1

Lyme Disease

Lyme disease is caused by the spirochete *Borrelia burgdorferi* that is carried by the blacklegged tick (*Ixodes scapularis*). Lyme disease has affected thousands of people in the United States and is a serious human health concern. Because white-tailed deer serve as a host for the blacklegged tick, there is public concern regarding white-tailed deer and their relationship to the incidence of Lyme disease.

Deer and other mammals, such as raccoons and foxes, serve as hosts for the adult stage of the tick, while small rodents such as mice serve as hosts for the immature stages. A direct relationship between numbers of deer and the incidence of Lyme disease remains unresolved. A June 2003 publication in The New England Journal of Medicine recommends the following strategies for decreasing the risk of Lyme disease and other tick-borne illnesses:

- Area-wide application of acaricides (mite and tick pesticides).
- Landscaping to provide desiccating barriers between tick-infested areas and lawns.
- In some settings, the exclusion or removal of deer (Hayes and Piesman 2003).

However, other recent studies regarding Lyme disease and the relationship to deer suggest that controlling deer populations may not effectively control Lyme disease. Ostfeld et al. (2006) concluded the risk of exposure to Lyme disease was correlated positively with the abundance of key hosts of the immature stages of the tick and with critical food resources for those hosts. They suggested that once deer abundance exceeded a low threshold value, further increases in deer density had little if any effect on tick densities. Current best estimates suggest that deer densities must be maintained at <10/square mile (less than 10 per square mile) to observe a reduction in tick densities and associated Lyme disease cases. The task force recommends that Lyme disease not be the major factor in determining deer management strategies.

The City will continue to monitor further research and development concerning Lyme disease. Currently, the best prevention of Lyme disease is through education that encourages people to use repellents, check themselves for ticks and avoid favorable tick habitat (U.S. Department of Health and Human Services 2005).

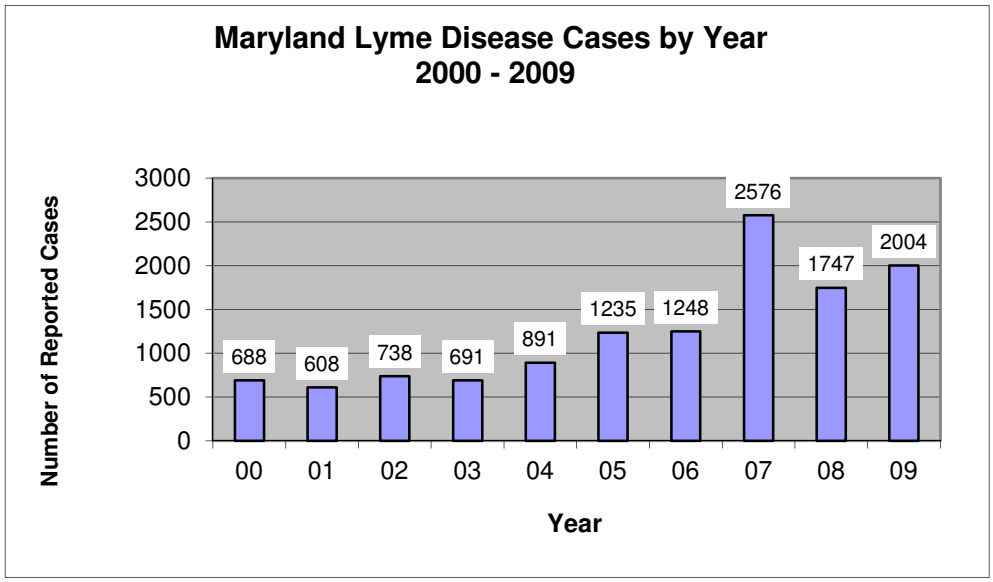

FIGURE 2

Cases as reported by the Center for Disease Control (CDC).
In 2009, 1,466 confirmed cases were reported with 558 more probable cases.
These numbers were combined for 2009 reporting.

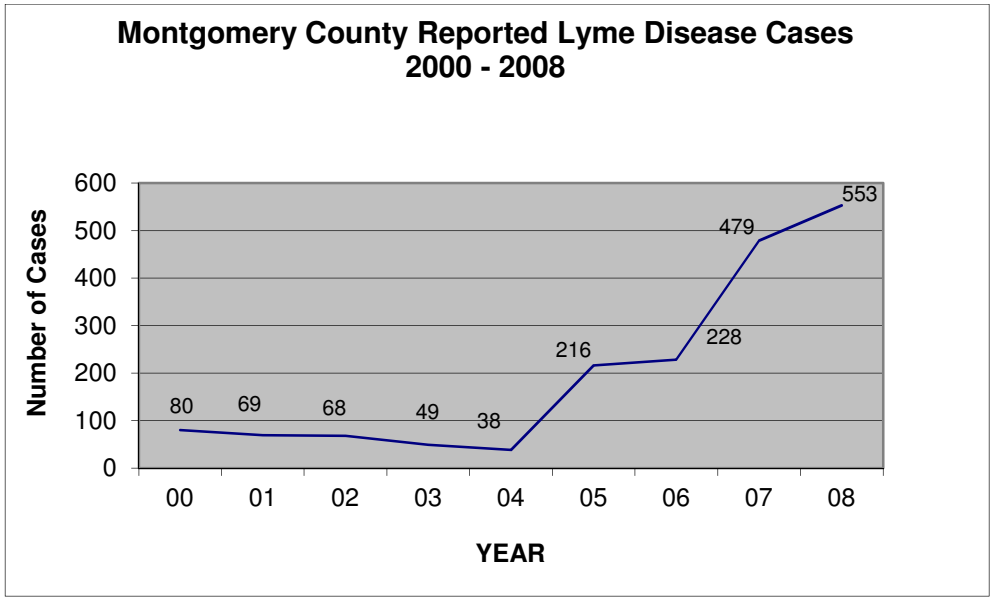

FIGURE 3

Cases as reported by the CDC. In 2008, 314 confirmed cases were reported with 239 probable cases combined for this chart. The rise in these numbers may be attributed to the increased awareness and reporting of Lyme disease

Ecological Impacts

White-tailed deer also cause many negative impacts to the natural environment. In areas of high density, loss of native bird habitat and damage to native flora and fauna can be found due to over-browsing. Studies indicate that intense browsing from high deer densities can change the forest species composition and the associated wildlife (Alverson and Waller 1997). High deer densities can also increase the density of exotic invasive plants in natural areas. Excessive deer browsing on native plants reduces the production of native species and allows exotic species to thrive. In addition, deer may spread exotic plants through their feces (William and Ward 2006; Myers et al. 2004).

Biological and Cultural Carrying Capacities (DNR White-Tailed Deer Report)

The number of individuals of a given species that a specific parcel of habitat can support in good physical condition over an extended period of time is defined as the Biological Carrying Capacity (BCC). White-tailed deer have high productivity due to their evolution as large prey for humans, wolves and mountain lions.

Deer reproduction causes populations to exceed the BCC unless productivity is balanced by mortality. When the BCC is exceeded, habitat quality decreases and herd health and physical condition decline (McCullough 1979, McShea et al.1997). Biologists use herd health indices and population density indices to assess the status of a herd relative to the BCC. The importance of compatibility between land-use practices and deer populations in Maryland justifies the consideration of another aspect of carrying capacity.

Cultural Carrying Capacity (CCC) is the maximum number of deer that can coexist compatibly with the local human population. The CCC is a function of sensitivity of the local human population to the presence of deer and may be higher or lower than the BCC.

This sensitivity is dependent on land-use practices, deer density and the attitudes and priorities of the human population. Numerous deer vehicle collisions, agricultural damage, home garden complaints and over-browsed forests that reduce recreational opportunities for bird watchers and naturalists due to overabundant deer are all indicators that the CCC has been exceeded. It is important to note that even low deer densities can exceed the CCC. A single deer residing in an airport landing zone is too many deer for that situation.

Effective deer management aims for a deer population level that will maintain a healthy environment and strike an acceptable balance between people and deer. It's a complex challenge that requires balancing biological, political and social demands. The DNR recommends a BCC and CCC in the range of 20-35 deer per square mile for urban areas like the City of Rockville.

Browsing of Landscape Plantings and Vegetable Gardens
White-tailed deer will browse on a wide variety of plant material, much of which can be found in the home landscape and commercial landscape, e.g., azaleas, taxus, cherry trees, tulips and roses. Browsing can cause considerable damage, such as deformed shape or death to desirable plants, and antler rubbing by bucks can damage trees and shrubs by creating entry points for insects and disease.

V. MANAGEMENT OF THE WHITE-TAILED DEER

Definition
White-tailed deer management consists of all actions undertaken by the City for the express purpose of managing the impacts associated with deer populations and/or resolving conflicts from deer activity, whether those actions are initiated by Mayor and Council policy, staff or are in response to public inquiries.

Goals
Encourage residents to tolerate deer activities, minimize conflicts between deer and the public, and reduce the negative impacts associated with deer.

Objectives

- Promote the intrinsic value of deer as a natural resource and provide opportunities for people to enjoy and appreciate this beautiful and important animal.
- Provide educational material at public facilities. Develop an educational program to provide Rockville residents with information about deer biology and methods to minimize deer/human conflicts on their property.
- Take measures to reduce the number of deer/auto collisions by targeting specific locations, including signage or fencing.
- Make deer management decisions based on the best available science and data.
- Obtain annual data regarding deer vehicle collisions within the City of Rockville and surrounding Montgomery County.
- Obtain deer population data using the best available methods.

Impacts
For management purposes, deer activity that results in conflict will be evaluated by the City for the existence of or potential for:

- Impact to public health and safety.
- Impact to public parks, forests and facilities.
- Impact to the environment and private property.

The significance of these impacts will determine the type of management techniques employed. Deer management actions will be based on the following:

- Best available science.
- Animal welfare concerns.
- Applicable laws and regulations.

Applicable City, County and State Laws

Under Rockville City Code, Section 14-37, "a person may not catch, destroy or interfere with any wild animals within the City limits." This code protects white-tailed deer from harm and, subsequently, there is currently no lethal reduction of deer allowed within the corporate limits of Rockville.

Under Rockville City Code, Section 13-61, "a person may not discharge any firearm, rifle, shotgun, revolver, pistol, air-gun, air rifle, or similar mechanism that is designed to expel a projectile through a gun barrel by the action of any explosive, gas, compressed air, spring, or elastic within the corporate limits of the City whether such mechanism is loaded with blank or live cartridges or projectiles of any kind." Currently, this code prohibits any form of lethal reduction by a firearm.

Legal responsibility for white-tailed deer is vested with the state of Maryland through Natural Resource Article, §§10-205, 10-301 and 10-415, Annotated Code of Maryland through regulation COMAR 08.03.03.06. The DNR provides for deer population management through harvest regulations, which are implemented by establishing the length of hunting season, permitted weapons, bag limits and sex of deer to be harvested. The task force is not recommending traditional hunting open to the general public. Therefore, the standard harvest regulations would not apply in all cases.

Data Collection

The Neighborhood Services Department and the Department of Recreation and Parks will monitor complaints about nuisance deer and deer/vehicle incidents.

The Recreation and Parks Department shall monitor the effects of white-tailed deer on parks and natural areas.

Forward Looking Infrared Radar (FLIR) Surveys may be used to monitor deer populations. These surveys have been used by DNR, Montgomery and Howard counties to monitor and assess deer population levels in certain areas of the state. During the 1990s, the City also had surveys flown over portions of Rockville. The technique involves using helicopters equipped with FLIR that fly a prescribed course over certain areas. Flights must occur at dusk or at night, during colder weather and when leaf cover is minimal. The FLIR detects the heat sources of deer and other animals and records the images on videotape. Trained observers review the tape and count the number of deer

recorded during the flight. Deer populations can then be estimated in that particular area. Forward Looking Infrared Radar was used extensively in central Maryland in the late 1990s and early 2000s. Since Sept. 11, 2001, restricted flight zones in the metropolitan Washington, D.C. area have made it impossible to fly an adequate number of transects to continue the survey. However, FLIR, using private contractors, remains a viable population monitoring tool for small parcels.

Game cameras will be considered as an additional option for population estimation.

VI. PROCEDURES

All public concerns about deer activity creating conflicts will first be investigated in the field by the City.

Deer Conflicts on Private Property

When there are impacts to private property, the property owner will be counseled to accommodate the deer and tolerate some inconvenience. Interpretive information on deterrence exclusion methods and repellents will be provided. Staff will recommend various options such as fencing, alternative plant selections and use of repellants.

Deer Conflicts on Public Lands

When there are impacts to public areas, the City may decide to implement management techniques to protect resources. However, damage to trees, shrubs and other plants on parkland, in the absence of other impacts, does not necessarily constitute reason for management. A field investigation of habitat suitability may be conducted to determine overall impacts to natural resources.

If it is determined that the deer population is unsuitable, based on the BCC and CCC and general over population of deer could be contributing to deer vehicle collisions or other safety hazards, the City will consider implementing appropriate management techniques. Those techniques may include deterrence, fencing or exclusion.

In roadways adjacent to public lands, various traffic control devices, including deer crossing signs and warning lights, may be considered.

Evaluation

The City will monitor and evaluate the success and failures of actions taken based on the annual report and recommendations. The evaluation will be used to develop recommendations for subsequent years. The City will monitor and evaluate the MNCPPC and DNR white-tailed deer management programs for success and failure. The City will continue to monitor advances in white-tailed deer management, including the use of contraceptives. If the use of fertility controls becomes a recommended technique by the DNR, the City should consider it a viable option.

VII. ANNUAL REPORT and RECOMMENDATIONS

The WTDTF recommends that staff, with guidance from the Montgomery County Deer Management Work Group (MCDMWG), develop an annual report and recommendations. The MCDMWG meets annually and includes professionals from the MNCPPC, DNR, National Park Service, Montgomery County Cooperative Extension Service, Montgomery County Police Department, USGS Biological Services Division, Patuxent Wildlife Research Station and the Washington Suburban Sanitary Commission.

This group coordinates and develops deer management actions throughout Montgomery County. This group of experts would annually review management techniques for the City. The MCDWG would replace the WTDTF. Any management techniques proposed for Rockville would be included in the Montgomery County Annual Report. This will ensure that Rockville is using techniques that are consistent with other activities within the County and are based on the best available science. The City will benefit from the years of experience and expertise of this group.

Staff will present the annual report and recommendations to the Recreation and Park Advisory Board and the City's Environment Commission for comment. The annual report and recommendations will be based on current data and the best available science. Based on the data collected and recommendations from the MCDMWG, the annual report and recommendations will include deer population estimates, deer vehicle incidents, proposed management techniques, locations of all activities proposed and results from the previous year. The specific management techniques used and locations will likely vary from year to year. Specific management techniques used may include deterrence, fencing, traffic control devices, repellents or continued tolerance.

The WTDMP will be administered by the Recreation and Parks Department, and coordinated with other City departments as necessary.

VIII. PROCEDURES FOR DECISION MAKING

The annual report and recommendations will be developed using the following process:

1. Staff will gather data from previous years, including FLIR surveys, DVC data and citizen comments and complaints.
2. Staff will assess the performance of the previous year's activities and review techniques used in surrounding jurisdictions.
3. Staff will develop a draft annual report and recommendations considering non-lethal measures.
4. Staff will review the draft annual report and recommendations with the MCDMWG. The group will assist staff with refining the annual report and recommendations.

5. Staff will present the annual report and recommendations to the Recreation and Park Advisory Board and the Environmental Commission.
6. Staff will publicize the annual report and recommendations. There will be a two-week comment period.
7. Staff will review the public comments, develop a final plan and recommendations, and present it to the City Manager.
8. Upon approval of the City Manager, staff will implement the annual report and recommendations.
9. Each year, staff will assess the effectiveness of its past recommendations and repeat the decision-making process above.

IX. MANAGEMENT TECHNIQUES

The techniques listed below are options available for deer management. Some, if not all, have been used in surrounding jurisdictions.

Deterrence

Any device or substance, including but not limited to taste or order repellants, designed to repel deer from the area where they are not desired.

- Effectiveness
  Some devices/substances may be effective if frequently applied to a localized area. Effectiveness may diminish over time as deer adapt to them. Repellants are humane to the animals and widely available on the market to consumers.
- Application
  Deterrence techniques may be costly and require frequent application.

Fencing or Physical Exclusion

A fence or other barrier that permanently protects resources threatened by deer or prevents deer from accessing areas where they are not desired.

- Effectiveness
  Physical barriers are highly effective resource protectors that virtually eliminate deer from a specific localized area. These exclusionary methods may negatively impact the movements of other desirable species. Depending on the type of fencing used, there can be a significant cost.
- Application
  Individual plants can be protected with small screens or larger parcels of land may be protected with fences. The installation and maintenance of these devices may be costly.

Fertility Controls

- Effectiveness/Application
  Contraception has been experimentally tested on white-tailed deer for several decades with mixed results. The DNR has cooperated on three white-tailed deer contraception studies in Maryland in an effort to develop new technology that will make contraception a viable alternative in areas where other control methods are not feasible.

  A telephone survey conducted by Responsive Management (2007) found that a majority of the general Maryland population would support the use of deer contraception. The longest running Maryland contraception study has been at the .9 square-mile fenced campus of the National Institute of Standards and Technology (NIST) where the deer contraceptive agent porcine zona pellucida (PZP) has been used since 1995. At the beginning of the study, the deer population at NIST was estimated at 211 deer. The population increased to an estimated 291 deer in 1997 before declining to 196 deer in 2007 (Rutberg and Naugle 2007). Researchers at NIST reported that annual deer population change at NIST was strongly correlated with population fertility. When population fertility at NIST dropped below 0.40 fawns per female, the population declined (Rutberg and Naugle 2008).

  While using PZP appears to have been successful at stabilizing the deer population at NIST, the current deer population on-site remains at greater than 200 deer per square mile after 11 years of treatment; a density that is at least ten times higher than the recommended density required to minimize habitat damage and human conflicts. Rutberg and Naugle (2008) report that the usefulness of PZP as a management tool will depend on the effectiveness of the vaccine, accessibility of deer for treatment, and site specific birth, death, immigration and emigration rates.

  Two other studies in Maryland evaluated the contraceptive agent GonaCon™. However, unlike the NIST study, the GonaCon™ studies lethally removed deer by sharpshooting prior to contraceptive treatment to achieve a desired population density. The studies were conducted to determine if the desired deer densities could be maintained using contraception. Fagerstone et al.(2008) reported that a single shot of GonaCon™ could render female white-tailed deer infertile for one to four years. Both studies in Maryland found that approximately 50 percent of the treated females became fertile again after one year and would require retreatment to remain infertile. It is unknown at this point how long retreated females would remain infertile. GonaCon™ has been approved by the Environmental Protection Agency as a restricted use pesticide for use in free-ranging white-tailed deer. While it is approved for free-ranging deer, it is unlikely GonaCon™ will be effective for treating a wide spread, free-ranging deer population.

To be effective, the contraceptive must provide a one-shot treatment that renders female deer infertile for multiple years (not just a single year) and it must be capable of being administered to a large enough proportion of the female deer population to alter population size. Currently, GonaCon™ must be injected by hand into a captured deer. Based on current deer population estimates and contraceptive technology, approximately 80,000 female deer would need to be captured and administered GonaCon™ in Maryland for effective state-wide population control. Most of these deer would need to be recaptured and retreated in subsequent years. It is impossible to meet these requirements. Instead, GonaCon™ will most likely find its niche in treating deer that have a restricted range and where there is adequate access to the majority of the deer so treatments can be administered.

Maryland DNR is currently developing policies and guidelines that will include application guidelines and a certification program regarding the use of GonaCon™ in Maryland. Likewise, the department will continue to monitor the development of deer contraceptives and will cooperate on future studies as they are proposed. The cost of application ranges from $800 to $1,000 per deer, as reported by the DNR. The task force recommends continuing to monitor and review advances made with this and other similar products as they become available.

Trap and Relocate

- Effectiveness/Application
  Trapping deer in an area that is overpopulated and relocating them elsewhere would directly reduce deer-human conflicts in the locale from which they are removed. However, the potential would exist to create the same conflicts at the release site. Numerous capture methods exist, but there are few, if any, potential release areas that are experiencing low deer populations.

  Trapping, tranquilizing and transporting deer presents serious risks for both the deer and those handling them. Technicians are placed at risk of injury from hoofed and antlered captives, and may be exposed to accidental doses of tranquilizers. Deer disease such as Chronic Wasting Disease may be spread to relocation sites. The animals are under extreme stress throughout the procedure and mortality can be as high as 15 to 25 percent because of capture-induced stress. When released into areas with existing deer herds, mortality rates as high as 85 percent have been documented within 12 months of release. While public support for this method may be high in the some communities, the DNR does not allow trapping and relocating deer in Maryland.

X. PUBLIC INFORMATION AND EDUCATION

Description

The task force recommendations to the Mayor and Council make it clear that public information is an important part of the management of deer-human conflicts in the City. It is the aim of the information and education component to clarify deer-related issues, biology and ecology, and make information readily available to the general public.

Actions

The following actions are intended to better inform and educate the public, and to address commonly expressed concerns related to deer.

- Develop an informational brochure on white-tailed deer, including information on deer biology, ecology, deer-human conflicts and the management options that may reduce or end those conflicts. This brochure should provide a list of agencies and organizations involved in the issue, and how each may be contacted. It should be distributed throughout the City in all recreation centers, the Nature Center and other government office buildings, and be available online and to the homeowner associations and all Rockville residents.
- Offer educational programs through the Department of Recreation and Parks and interested organizations such as garden clubs. These programs would include information similar to the brochure, and would also serve as a forum for exchange of new ideas and opinions for the task force to process.
- Develop and maintain, through the Public Information Office, a plan to provide timely and relevant information on deer, suited to the needs of the season. Information would be distributed through print, Web and social media, as well as broadcast segments on Rockville 11 (cable channel 11). Some information could be issued to media, but most educational and communicative information would be distributed through City communication tools such as Rockville Reports, the Web and Facebook.
- Develop and produce an exhibit display on deer issues and the management plan. This display could be housed at the Croydon Creek Nature Center, rotated through the community centers, other public buildings and other locations if requested.
- Produce and distribute an annual update on deer management activities and information for all interested parties. Note all significant accomplishments and milestones reached during the preceding year.
- Develop a deer management website, with appropriate links, to disseminate information through the increasingly popular medium of the Internet.

XI. REFERENCES

The WTDTF relied primarily on research and data from other jurisdictions. Below are the main references used and/or cited in the WTDMP.

- Montgomery County Deer Management Program – Montgomery County Deer Management Work Group, Rob Gibbs, Chair – 2009
- Maryland White-Tailed Deer Plan – Maryland Department of Natural Resources, Wildlife and Heritage Service – 2009
- Center for Disease Control and Prevention website – (used to provide all Lyme Disease Information).
- Community-Based Deer Management: A Practitioners' Guide – Daniel J. Decker, Daniela B. Raik and William F. Siemer of the Human Dimensions Research Unit, Cornell University – 2004
- Howard County Deer Management Program – Howard County Department of Recreation and Parks – 2002
- Survey: Deer and Deer Management in Howard County, Maryland – Donald F. Norris, Institute for Policy Analysis & Research, UMBC, Maryland – 2008
- Thinking Outside The Marketplace: A Biologically Based Approach To Reducing Deer Vehicle Collisions
- Metropolitan Washington Council of Governments: Deer-Vehicle Collision Report – COG, Animal Services Committee, Wildlife-Vehicle Collision Reduction Working Group – 2006
- Evaluation of Wildlife Warning Reflectors for Altering White-Tailed Deer Behavior Along Roadways – Daniel B. Warnell School of Forestry and Natural Resources, University of Georgia; Department of Animal Services, Berry College – 2006
- Methods to Reduce Traffic Crashes Involving Deer: What Works and What Does Not – James Hedlund, Paul Curtis, Gwen Curtis and Allan Williams – Highway Safety North and Cornell University – 2003
- Montgomery County, Maryland Deer Management Program Deer Impact Data Collection and Results 1996 – 2007 – Montgomery County Deer Management Work Group
- An Evaluation of Deer Management Options (Northeast Deer Technical Committee) – New England Chapter of the Wildlife Society and the Northeast Deer Technical Committee – 2008
- Effectiveness of Temporary Warning Signs in Reducing Deer-Vehicle Collisions during Mule Deer Migrations – Todd Sullivan, Allan Williams, Terry Messmer, Laurie Hellinga, Sergey Kyrychenko of the Jack H. Berryman Institute, Department of Forest, Range and Wildlife Sciences, Utah State University – 2003